

Patent Claims

1. Method for the structured metallization of polymer substrate materials and ceramic substrate materials, wherein a surface-activatable compound containing a nonconductive organic transition metal complex as surface-activating compound, a dicarboxylic acid as cross-linking agent, and melamine resin as complexing agent is applied to the substrate material by means of suitable coating, the surface-active compound is selectively irradiated by light, and an electroless metallization of the irradiated areas is subsequently carried out to form metallic structures in a chemically reductive bath.
2. Method according to claim 1, characterized in that the surface of the substrate of a polymer material is pretreated chemically, physically or thermally in order to roughen it.
3. Method according to claim 2, characterized in that the substrate is pretreated by etching the substrate surface.
4. Method according to claim 3, characterized in that the etching solution is a hydrochloric acid solution diluted in water.
5. Method according to claim 3 or 4, characterized in that the etching process takes place by heating the etching solution.
6. Method according to claim 1, characterized in that the transition metal complex contains palladium.
7. Method according to claim 1, characterized in that the nonconductive surface-activatable compound is dissolved in a solvent and applied to the substrate in the form of a liquid.
8. Method according to claim 7, characterized in that the solvent is tetrahydrofuran,
9. Method according to claim 1, characterized in that the light is laser irradiation at a wavelength of less than 600 nm.
10. Method according to claim 9, characterized in that the laser radiation is generated with a frequency-doubling or frequency-tripling Nd:YAG laser ($\lambda = 532 \text{ nm}$ or 355 nm).

11. Method according to claim 9, characterized in that the laser radiation is generated by an argon-ion laser ($\lambda = 488 \text{ nm}$).
12. Method according to claim 1, characterized in that the removal of non-irradiated surface-activating compound after irradiation is carried out in tetrahydrofuran.
13. Surface-activating compound for activating the surface of a polymer substrate or ceramic substrate for electroless metallization with a nonconductive organic transition metal complex as activating compound, a dicarboxylic acid as cross-linking agent, and melamine resin as complexing agent.
14. Surface-activating compound according to claim 13, characterized in that the activating compound is a transition metal complex based on palladium and the dicarboxylic acid, as cross-linking agent, is maleic anhydride.
15. Surface-activating compound according to claim 14, characterized in that the compound, in relation to a solvent proportion of 100 parts by weight, contains 0.8 to 2.0 parts by weight of palladium diacetate, 5 to 15 parts by weight of melamine resin, and 0.2 to 0.5 parts by weight of maleic anhydride.